Remarks:

Responsive to the office Action dated 02/21/2005:

1. Applicants hereby confirm, without traverse, the telephone election made on 01/13/05 of Claims 1-18 for further prosecution
2. Each of the currently named inventors has made an inventive contribution to at least one of Claims 1-18.
3. Claims 1 and 5-11 have been rejected under 35 U.S.C. 102(b) as being anticipated by Bergmann et. al., US Patent No. 6,374,012 (hereinafter "Bergmann").
4. Claims 2, 3 and 18 have been rejected under 35 U.S.C. 103(a) as being unpatentably obvious over Bergmann.
5. Claims 12, 13, 16 and 17 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Bergmann in view of von Kopylov, et. al., US Patent No. 6,785,307 ("Kopylov").
6. Claims 14 and 15 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Bergman in view of Cheng US Patent No. 5,850,493("Cheng").
7. The Examiner has not made a specific rejection of Claim 4, but applicants will respond to this Office Action based on the assumption that the Examiner deems Claim 4 to be unpatentable over Bergmann, either alone or in combination with one of the other cited references.
8. The Rejections under 35 U.S.C. §102 and 103 are respectfully traversed.

ARGUMENTS:

The Examiners attention is particularly directed to page 2, line 20 to page 3, line 6 and also to page 4 lines 15 through 22 of the Application where Applicants clearly point out the critical distinction between their invention and Bergmann, (a reference which was cited and distinguished by Applicants in the Specification). The above-cited portions of the Specification explain the significant advantages of Applicants' design in comparison with that of Bergmann. The Examiner has particularly cited column 11, lines 33-37 and also column 5, lines 42-43 of Bergmann, and stated that the weak lens described in

Bergmann is translatable along the path of the light beam. Column 11, lines 33-37 of Bergmann describes Figure 10 in which weak lens 97 is mounted on a lens holder 96. The lens and holder clearly cannot move along the path of beam 103 but only up or down or perpendicularly to the plane of the page and therefore at right angles to the beam path, as clearly described at column 10, lines 28-31 of Bergmann. In their Specification at page 2, lines 21-24 Applicants have described the Bergmann reference as follows: "For example, US Patent No. 6,374,012 teaches the use of a magnetically mounted weak lens having **only** X and Y degrees of freedom i.e., allowing for movement **only** in a plane perpendicular to the path of beam propagation) for optic fiber alignment" (emphasis added).

The Examiner has recognized that the weak lens of Bergmann does not have three degrees of positional freedom and has suggested that movement of the wave guide along the axis of the optical beam (e.g. by sliding the wave guide within the sleeve) is equivalent to movement of the weak lens along the beam axis. This fails to recognize a basic advantage of Applicants invention as described and claimed.

As Applicants state on page 3, lines 8-24 of their Application, "Although there are numerous known, essentially permanent attachment processes for optical components (e.g., laser welding, UV or thermally activated adhesives, soldering, etc.), all of these processes can cause a shift in the location of the optical component during the attachment process. The basic problem is that generally optical components are aligned, and the optical system tested to achieve optimum performance, of necessity before all the major optical components are firmly, i.e., essentially permanently affixed to a mount, container or other rigid structure. This is necessary because some repositioning or realignment of components in what is sometimes referred to as the "optical train" (i.e., the collection of optical components placed along the optical beam path) is frequently required during the initial assembly and testing. Only after such initial assembly and testing are the optical components firmly affixed (i.e., mounted) so that they will not subsequently shift position during shipment, installation and operation. Additionally, after the initial assembly, or even after the final permanent mounting, a baking, annealing or other thermal treatment

of the assembled components is frequently required or desirable. The frequent effect of the final permanent mounting and/or heat treatment is to cause a positional shift in one or more of the critical optical train components, thereby adversely affecting the coupling of radiation (i.e., the power) into the waveguide."

Also, at page 4 lines 19-34 Applicants state "The weak lens enables one to compensate for losses in the coupling efficiency caused by motion of one or more of the critical optical components (e.g., the strong lens and/or the waveguide) during the attachment and/or thermal conditioning process.

By adding an appropriately mounted weak lens, and both adjusting it to optimize coupling and then rigidly attaching the weak lens only after the critical optics (especially the waveguide and the strong lens) **have been substantially immovably attached,** losses in the coupling efficiency into the waveguide can be substantially recovered **by moving the weak lens in the Z and X or Y axes** as appropriate. Adjustments of the weak lens in the X and Y direction are used to compensate for shifts along the X and Y axes that occurred in the critical optics during attachment. The X and Y shifts in the weak lens enable one to re-center the optical beam on the waveguide entrance. Shifting the weak lens in the Z direction **(along the beam axis)** is required if the strongly focusing optics are no longer producing the optimum spot size or focal position at the waveguide entrance but rather producing an over-focused or under-focused optical beam or a focus before or after the waveguide entrance."(emphasis added)

As above indicated, the ability to move the weak lens along the Z axis (the axis of the optical beam) as well as having at least one additional degree of positional freedom, is a critical aspect of Applicants invention. Applicants invention is based on the premise, as shown by the examples, that being able to make a final focusing adjustment of the weak lens after rigidly affixing the other components of the optical train is uniquely advantageous. This is flatly contrary to the teaching of Bergmann which teaches the adjustment not of the weak lens but rather of the position of the waveguide along the optical beam. All of the designs shown by Bergmann are clearly incapable of altering the longitudinal position of the weak lens, and hence are incapable of addressing the problem solved by Applicants' invention. A major thrust of Applicants' invention is to rigidly

mount the major optical components of the optical train other than the weak lens and then make any necessary final alignment of the weak lens to optimize the focusing of the light beam through the optical train.

Applicants have pointed out the advantages resulting from adjusting the position of the weak lens to make the final focusing adjustment to optimize coupling efficiency only after rigidly affixing the other optical components. Any shifting of the weak lens when it is finally rigidly affixed in the optical train will have a much smaller effect on coupling efficiency (output power) than a movement of the wave guide as shown, for example, by a consideration of Figures 5a, 5b, and 6 of the Specification.

The rejection of Claims 12, 13, 16 and 17 over a combination of Bergmann and Kopylov is also respectfully traversed. This rejection is fundamentally dependent on Bergmann with Kopylov presumably being cited to show particular alternative features of Applicants' invention. Claims 12, 13, 16 and 17 are directed to alternative embodiments of Applicants' invention. Applicants do not claim to have invented the use of a frequency doubling crystal or external cavity semiconductor laser in conjunction with other optical components. The connection between Kopylov and Bergmann is not perceived. Kopylov is directed to adjusting the wavelength of a laser by changing the cavity length. It does not discuss adjusting beam focusing by means of a weak lens.

The rejection of Claims 14 and 15 over a combination of Bergmann and Cheng is likewise respectively traversed. Claims 14 and 15 are also directed to particular embodiments of Applicants' invention. Cheng does not address the matter of a weak lens or adjusting the position of a lens or lenses in an optical train to optimize beam focus. Indeed, at Col. 3, lines 47-48, Cheng describes the lenses as being "spaced apart a **fixed** distance". (emphasis added)

Conclusion

In summary, Applicants' position is that Bergmann not only does not suggest focusing by movement of a weak lens along the optical axis (beam path), but indeed that all the designs shown in this reference are incapable of such axial movement of the weak lens. Furthermore, Applicants' ability to move the weak lens along the beam axis provides an unobvious advantage in comparison with a movement of any of the other components of the optical train. Issuance of pending claims1-18 is therefore respectfully requested.

The Commissioner is hereby authorized to charge any deficiency in the fees filed, asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to Deposit Account No. 50-3253.

A duplicate copy of the transmittal cover sheet attached to this Response to the Office Action Mailed 01/21/2005, is provided herewith.

Respectfully submitted,

Herbert Burkard

Dated: 04/04, 2005 By: Herebert Burkard
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